

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for growing a mono-crystalline emitter for a bipolar transistor, comprising:
 - providing a trench formed on a silicon substrate having opposed silicon oxide side walls;
 - selectively growing a highly doped first mono-crystalline layer on the silicon substrate in the trench;
 - forming an amorphous or polysilicon layer over the silicon oxide side walls; and
 - forming a second mono-crystalline layer over the first mono-crystalline layer;
 - wherin the amorphous or polysilicon layer and the second mono-crystalline layer are formed by non-selectively growing a second silicon layer over the trench in order to form an amorphous or polysilicon layer over the silicon oxide sidewalls and a second mono-crystalline layer over the first mono-crystalline layer.
2. (previously presented) The method of claim 1, wherein the step of selectively growing a highly doped first mono-crystalline layer is accomplished using selective epitaxial growth.
3. (original) The method of claim 2, wherein the selective epitaxial growth using a precursor selected from the group consisting of: SiH₂Cl₂, SiH₄, SiCl₄, SiCl₃, Si₂H₆, Si₃H₈, GeH₄, and SiH₃CH₃.
4. (previously presented) The method of claim 1, wherein the step of non-selectively growing the second silicon layer is accomplished using differential epitaxial growth.
5. (previously presented) The method of claim 1, wherein the first mono-crystalline layer

is substantially grown only on an active area on the silicon substrate.

6. (original) The method of claim 1, comprising the further step of performing a salicidation process using a silicide selected from the group consisting of: titanium, cobalt and nickel.

7. (previously presented) The method of claim 1, wherein the first mono-crystalline emitter is n-type doped with an element selected from the group consisting of: phosphorous and arsenic.

8. (currently amended) A method for forming a highly n-type doped layer in a semiconductor wafer, comprising:

providing a first active region comprised of a silicon substrate;

providing a second region comprised of silicon oxide;

selectively growing a highly doped first mono-crystalline layer on the silicon substrate; and

forming an amorphous or polysilicon layer over the silicon oxide; and

forming a second mono-crystalline layer over the highly doped mono-crystalline layer;

wherein the amorphous or polysilicon layer and the second mono-crystalline layer are formed by non-selectively growing a second silicon layer over the first active region and the second region, silicon substrate and silicon oxide to form a second mono-crystalline layer over the silicon substrate and an amorphous or polysilicon layer over the silicon oxide.

9. (previously presented) The method of claim 8, wherein the step of selectively growing a highly doped first mono-crystalline layer is accomplished using selective epitaxial growth.

10. (original) The method of claim 8, wherein the selective epitaxial growth uses a precursor selected from the group consisting of: SiH₂Cl₂ and SiH₄, SiCl₄, SiCl₃, Si₂H₆, Si₃H₈, GeH₄, and SiH₃CH₃.

11. (original) The method of claim 8, wherein the step of non-selectively growing the second silicon layer is accomplished using differential epitaxial growth.
12. (previously presented) The method of claim 8, wherein the first mono-crystalline layer is substantially grown only on the active region.
13. (original) The method of claim 8, comprising the further step of performing a salicidation process using a silicide selected from the group consisting of: titanium, cobalt and nickel.
14. (previously presented) The method of claim 8, wherein the highly n-type doped layer is doped with an element selected from the group consisting of: phosphorous and arsenic.
15. (currently amended) A method for growing a mono-crystalline emitter for a bipolar transistor, comprising:
 - providing a trench formed on a substrate having opposed silicon oxide side walls;
 - growing a highly doped layer on the substrate in the trench using selective epitaxial growth; **and**
forming an amorphous or polysilicon layer over the silicon oxide side walls; and
forming a mono-crystalline layer over the highly doped layer;
wherein the amorphous or polysilicon layer and the second mono-crystalline layer
are formed by growing a second layer over the trench using differential epitaxial growth
in order to form an amorphous or polysilicon layer over the silicon oxide sidewalls and a
mono-crystalline layer over the highly doped layer.
16. (original) The method of claim 15, wherein the selective epitaxial growth using a precursor selected from the group consisting of: SiH₂Cl₂, SiH₄, SiCl₄, SiCl₃, Si₂H₆, Si₃H₈, GeH₄, and SiH₃CH₃.
17. (original) The method of claim 15, wherein the highly doped layer comprises a mono-crystalline layer that is substantially grown only on an active area on the substrate.
18. (original) The method of claim 15, comprising the further step of performing a

salicidation process using a silicide selected from the group consisting of: titanium, cobalt and nickel.

19. (previously presented) The method of claim 15, wherein the mono-crystalline emitter is n-type doped with an element selected from the group consisting of: phosphorous and arsenic.

20. (previously presented) The method of claim 15, wherein the mono-crystalline emitter is p-type doped using boron.